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THE IMPACT OF HIGH- AND LOW-PREFERENCE STIMULI ON VOCATIONAL AND ACADEMIC PERFORMANCES OF YOUTHS WITH SEVERE DISABILITIES

RICHARD B. GRAFF

NEW ENGLAND CENTER FOR CHILDREN AND
NORTHEASTERN UNIVERSITY

LENWOOD GIBSON

RIVER ST. SCHOOL

AND

G. TRACEY GALIATSATOS

NEW ENGLAND CENTER FOR CHILDREN

Pictorial and tangible paired-stimulus preference assessments were compared with 4 adolescents with developmental disabilities. In the tangible assessment, two stimuli were placed in front of the participant on each trial; in the pictorial assessment, two line drawings were placed in front of the participant on each trial. Approach responses were recorded for each assessment. The assessments generated similar preference hierarchies for all participants. Reinforcer assessments confirmed that response rates were higher when access to high-preference items was available than when low-preference items were available. Implications for assessing preferences and selecting items to be used in training programs are discussed.

DESCRIPTORS: pictures, preference assessment, reinforcer assessment

Paired- or multiple-stimulus preference assessments generate distinct preference hierarchies, from which relatively high-preference stimuli can be identified for individuals with developmental disabilities. High-preference stimuli have been repeatedly shown to be efficacious as reinforcers in subsequent concurrent-operants reinforcer assessments (e.g., Fisher et al., 1992). However, research has also shown that items ranked lower may function as reinforcers when high-preference items are no longer available for responding (e.g., Roscoe, Iwata, & Kahng, 1999; Taravella, Lerman, Contrucci, & Roane, 2000). These seemingly discrepant outcomes led to the subject of the current study: Will more highly preferred items result in more responding than lower ranked items when provided as consequences for relevant vocational and academic task-related behavior of youths with severe disabilities? In addition, we sought to determine if pictorial paired-stimulus assessments (e.g., Graff & Gibson, 2003) would also be predictive of differences in reinforcer efficacy.

Address correspondence to Richard B. Graff, New England Center for Children, 33 Turnpike Road, Southborough, Massachusetts 01772 (e-mail: rgraff@necc.org).

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METHOD

Participants and Setting

James, age 15, and Brian, age 14, had been diagnosed with autism spectrum disorder (ASD) and attended a residential school. Both did not speak and used picture communication systems. Charlie, age 14, had been diagnosed with a chromosomal disorder. Bud, age 15, had been diagnosed with attention deficit hyperactivity disorder. Charlie and Bud both communicated vocally and attended a day school for individuals with ASD. Sessions were conducted two to four times per week in one of the school's classrooms.

Response Measurement and Interobserver Agreement

Approach responses (picking up an item during tangible assessments or touching a line drawing during pictorial assessments) were recorded with paper and pencil; if no response was made, "no response" was recorded. Preference hierarchies were generated based on the mean percentage of trials each stimulus was approached, aggregated across sessions. A second observer independently recorded data in 50% of sessions across both assessment conditions. Interobserver agreement was calculated by dividing the number of agreements (both observers recording the same stimulus approached on a trial) by the number of agreements plus disagreements and multiplying by 100%; interobserver agreement was 100%. For reinforcer assessments, the number of items completed (sorted, stamped, or written) was counted and recorded after each session. Interobserver agreement was collected in 35% of reinforcer assessment sessions across participants (range, 33% to 50%) and was calculated by dividing the smaller number by the larger number and multiplying by 100%; agreement was 100%.

Preference Assessments

Two preference assessments were conducted with each child. The tangible assessment involved presenting the actual items, whereas the pictorial assessment involved presenting line drawings of the items. Eight items were evaluated in each assessment, and four assessment sessions were conducted with each individual. Each of the eight items was paired with every other item twice, for a total of 56 trials per assessment type. To allow potential shifts in preference to affect the assessments similarly, each session contained 14 trials of one assessment type followed by 14 trials of the other type; the order of trials varied across sessions. In both assessment types, participants were allowed to consume the edible item after approaching it.

Tangible assessment. The tangible assessment used procedures similar to those described by Fisher et al. (1992). For each participant, eight familiar consumable items were used. On each trial, two stimuli were placed approximately 0.5 m apart and 0.3 m in front of the individual; the positions of the stimuli were counterbalanced across trials.

Pictorial assessment. Pictorial assessment procedures were identical to those used in the tangible assessment except for stimulus presentation (pictures as opposed to actual items) and reinforcer delivery (being handed the item by the experimenter following a selection of a picture as opposed to picking up the item). Two line drawings corresponding to the same items used in the tangible assessment were placed in front of the participant on each trial (tangible stimuli were not visible until a choice was made).

Reinforcer Assessments

The reinforcing efficacy of a highly preferred item and a less preferred item were evaluated using maintenance tasks that participants performed as part of their ongoing educational and vocational training. Sessions were 5 min in duration, and both a reversal and an alternating treatments design were used to evaluate the reinforcing efficacy of both items. Response rates were not corrected by subtracting reinforcer delivery and consumption time, but edible items of similar size (and that took similar amounts of time to consume) were provided.

The task for James and Brian was placing an envelope into a jig and stamping it. Charlie's task was sorting silverware (placing spoons or forks into separate bins), and Bud's task was copying letters from a sample onto a worksheet (letters had to be written in correct order and be readable to data collectors). During baseline, materials were placed in front of participants, who were told once to complete the task and that no edible items would be provided. During alternating treatment phases, either a high-preference item or a low-preference item was available on a fixed-ratio 1 schedule for stamping one envelope, sorting one piece of silverware, or copying one letter. For Charlie, the schedule was thinned to

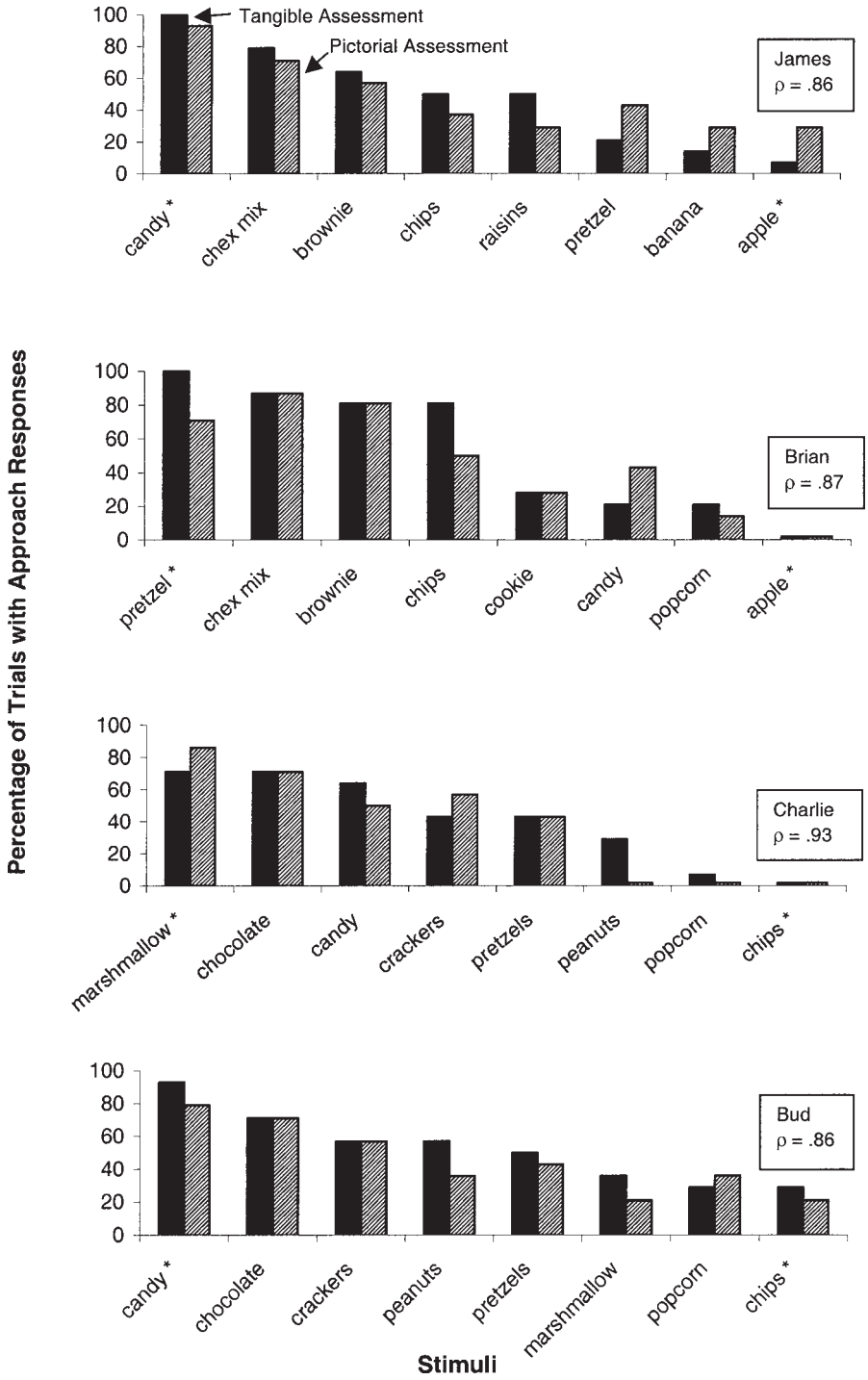

Figure 1. Results of the tangible and pictorial preference assessments for James, Brian, Charlie, and Bud. Solid bars depict the results of the tangible assessment; striped bars depict the results of the pictorial assessment. Spearman rank-order correlation coefficients are noted. Items designated with an asterisk indicate those used in reinforcer assessments.

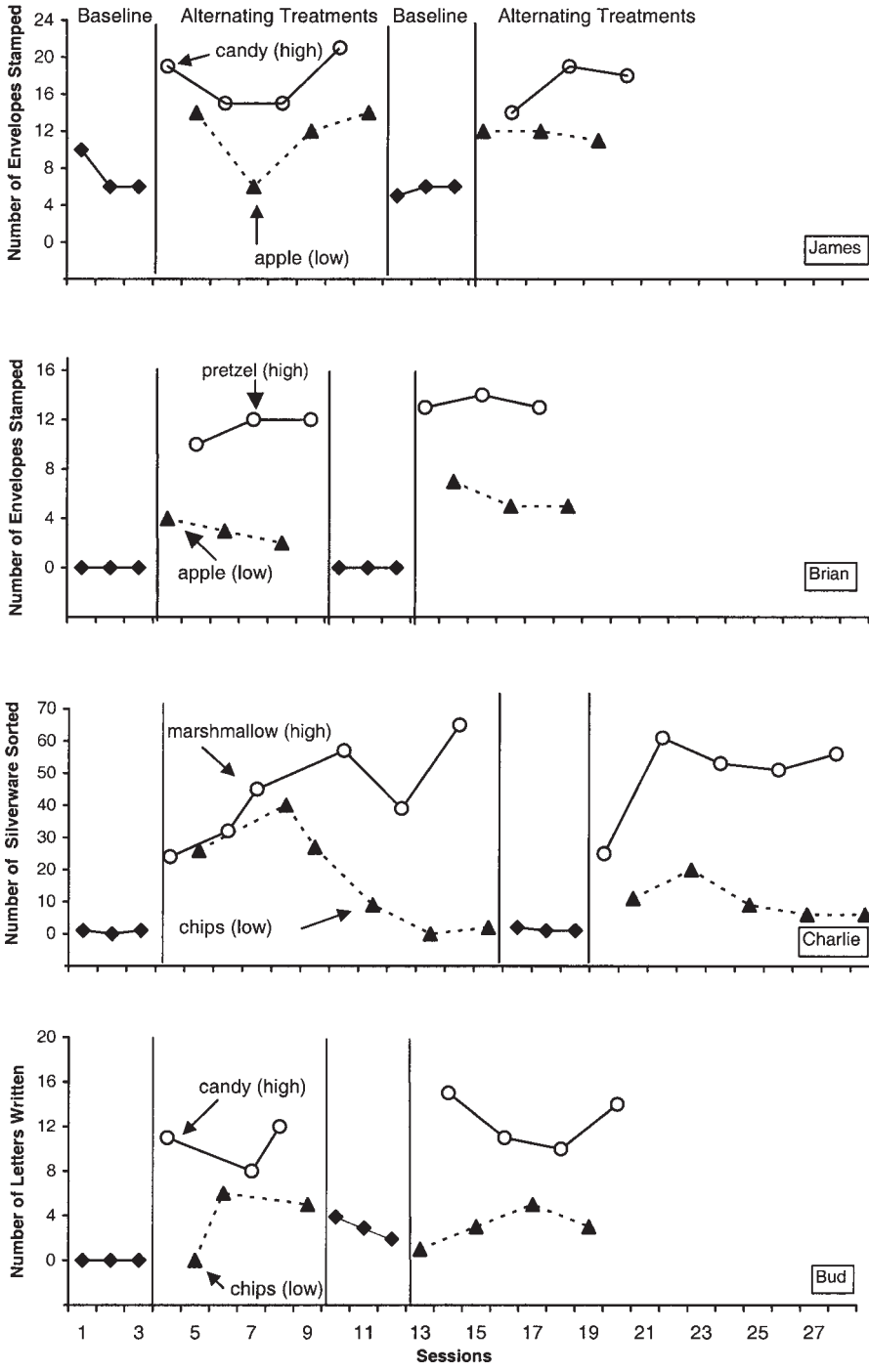

Figure 2. Response rates across sessions for James, Brian, Charlie, and Bud during the reinforcer assessments.

a variable-ratio 3 during the first session. At the beginning of each session, the experimenter verbally stated the name of the edible item that was available for responding on the task; in addition, edible stimuli were placed directly behind the task during these sessions.

RESULTS AND DISCUSSION

Results of the preference assessments are depicted in Figure 1. For all participants, both assessments generated similar preference hierarchies (Spearman correlation coefficients ranged from .86 to .93). Reinforcer assessments are depicted in Figure 2. For all participants, responding during baseline phases was relatively low and stable. During alternating treatments phases, low-preference stimuli were usually associated with weak reinforcement effects. Higher response rates were obtained when high-preference stimuli were used as consequences, and this outcome was predicted by both tangible and pictorial assessments.

Fisher et al. (1992) demonstrated that higher preference stimuli are more effective reinforcers than are low-preference stimuli when assessed concurrently, but Roscoe et al. (1999) showed that there may be little to no difference in reinforcing efficacy when high- and low-preference stimuli are assessed in single-operant arrangements. Although our data showed that low-preference items may function as reinforcers, they also showed that differences in the value of the items shown in the preference assessments were related to the absolute effectiveness of those items as reinforcers. Roscoe et al. used switch pressing to evaluate the reinforcing efficacy of stimuli and showed that high- and low-preference stimuli resulted in similar levels of responding for 6 of 7 participants. In contrast, we used relevant vocational and academic responses to determine the reinforcing efficacy of the high- and low-preference stimuli and observed higher levels of responding with high-preference stimuli. Therefore, it seems likely that differences in absolute value suggested by the results of paired-stimulus preference assessments may be better detected during reinforcer assessments when more complex responses are used. Based on our data, it seems important that assessments that generate valid preference hierarchies are adopted and the most preferred stimuli are used in training programs.

One limitation of this study was that only edible items were included in our assessments. We did this in an attempt to efficiently demonstrate the predictive validity of the tangible and pictorial paired-stimulus preference assessments. Future research should assess the predictive validity of pictorial paired-stimulus assessments for more complex social and community-based activities that cannot be immediately provided as consequences for choosing in preference assessments. Nevertheless, our data show that performance can be maximized by using an individual's most potent reinforcers (see also Carr, Nicolson, & Higbee, 2000), and that pictorial assessments may be used to identify these reinforcers.

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